December 1, 1950.

Dr.Joshua LEDERBERG
The University of Wisconsin
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MADISON 6.

Dear Dr.Lederberg,

Your letters dated Nov.21 and Nov.13 are here and I thank you most expressly for your courtesy.

I am sending the following strains:

CA.7: (coli V of Gratia) E.coli producing colicin V.
CA.18: E.coli producing colicin B.
CA.23: E.coli (IMVIC -+--) producing colicin D.
CA.31: E.freundii producing colicin A.
CA.38: E.coli producing colicin E.
CA.42: E.coli producing colicin F.
CA.46: E.coli producing colicin G.
CA.53: E.coli producing colicin I.
CA.57: paracoli (IMVIC ++--) producing colicin C.
CA.58: pigmented E.coli producing colicin H.
CA.62: paracoli (IMVIC ++--) producing colicin J and I.
K.235: lysogenic E.coli producing colicin K.
P.7: Sh.alcalescens producing colicin S2.
P.9: Sh.sonnei producing colicin S3 + another one.
P.12: Sh.paradys. Boyd D.1 producing colicin S1.
P.14: Sh.dispar producing colicin S5.
P.15: pigmented Sh.dispar producing colicin S4.
C.6: E.coli ♀ of GRATIA, sometimes designated CA.81, is the indicator strain very susceptible to all these colicins except colicin C (CA.57 has a slight activity against C.6 but is very active against any strain of S.schottmuelleri).

I shall be glad to send some resistant mutants but typing of the colicins is not as simple as you think, at least not with every colicin. Resistance to colicines is very similar to resistance to bacteriophages, cross-resistances are frequent, some resistant mutant are very stable but other are not and with some colicins, like G or H, it was never possible to get a true resistant mutant. For example, cross-resistance is the rule towards colicins E, F, J, S2, S3 and S5 (designated group E), the type-strains producing these colicins loose all or part of their activity against a mutant selected by any one of them but they differ by other characters such as range of activity against other strains, morphology of the inhibition zone, susceptibility to proteolytic enzymes and so on.

I have already made some experiments with strains K.12 - W.1364 and W.1113. K.12 is no colicin producer but has a susceptibility quite comparable to that of my indicator strain C.6 and identical to that of its mutant W.1364. Susceptibility to different phages of K.12 and W.1364 was also tested; they differ only by the resistance of W.1364 to phages T.1, T.5 and T.7. I have already derived from K.12 4 types of mutants resistant to different colicins

that I shall send you: WR.1 is resistant to colicins V ~~and I~~, WR.2 to colicin A, WR.3 is completely or partially resistant to all colicins of group E and to colicine A, and WR.4 is partially resistant to colicin K.

W.1113 which you refered to as causing direct antagonism was shown by my technique to produce a colicin active against C6 as well as K.12, may be colicin S.4.

I appreciate very much your offer of sending me suitable intercrossable cultures of E.coli K.12 and shall be glad to receive them as well as some directives for their proper use.

I am very sincerely yours.

Koch Twiss

Dr.P.Fredericq, Agrégé.